



— Installation assistance available at: —

RFTECH

www.rockfordfosgate.com/rftech

ELEMENT READY™ SUBWOOFERS

M1

M1D2-8
M1D2-8B
M1D4-8
M1D4-8B
M1D2-10
M1D2-10B
M1D4-10
M1D4-10B
M1D2-12
M1D2-12B
M1D4-12
M1D4-12B



600 South Rockford Drive • Tempe, Arizona 85281 United States
Direct: (480) 967-3565 • Toll Free: (800) 669-9899

rockfordfosgate.com

Installation & Operation

Introduction

Dear Customer,

Congratulations on your purchase of the world's finest brand of audio products. At Rockford Fosgate we are fanatics about musical reproduction at its best, and we are pleased you chose our product. Through years of engineering expertise, hand craftsmanship and critical testing procedures, we have created a wide range of products that reproduce music with all the clarity and richness you deserve.

For maximum performance we recommend you have your new Rockford Fosgate product installed by an Authorized Rockford Fosgate Dealer. Please read your warranty and retain your receipt and original carton for possible future use.

Great product and competent installations are only a piece of the puzzle when it comes to your system. Make sure that your installer is using 100% authentic installation accessories from Rockford Fosgate in your installation. Rockford Fosgate has everything from RCA cables and speaker wire to power wire and battery connectors. Insist on it! After all, your new system deserves nothing but the best.

To add the finishing touch to your new Rockford Fosgate image, order your Rockford accessories, which include everything from T-shirts to hats.

Visit our web site for the latest information on all Rockford products; www.rockfordfosgate.com or, in the U.S. call 1-800-669-9899 or FAX 1-800-398-3985. For all other countries, call +001-480-967-3565 or FAX +001-480-966-3983.

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If, after reading your manual, you still have questions regarding this product, we recommend that you see your Rockford Fosgate dealer. If you need further assistance, you can call us direct at 1-800-669-9899. Be sure to have your serial number, model number and date of purchase available when you call.

Safety

This symbol with “WARNING” is intended to alert the user to the presence of important instructions.  **WARNING**
Failure to heed the instructions could result in severe injury or death.

PRACTICE SAFE SOUND

Continuous exposure to sound pressure levels over 100dB may cause permanent hearing loss. High powered auto sound systems may produce sound pressure levels well over 130dB. Use common sense and practice safe sound.

PRATIQUEZ UNE ÉCOUTE SANS RISQUES

Une exposition continue à des niveaux de pression acoustique supérieurs à 100 dB peut causer une perte d'acuité auditive permanente. Les systèmes audio de forte puissance pour auto peuvent produire des niveaux de pression acoustique bien au-delà de 130 dB. Faites preuve de bon sens et pratiquez une écoute sans risques

PRACTIQUE EL SONIDO SEGURO

El contacto continuo con niveles de presión de sonido superiores a 100 dB puede causar la pérdida permanente de la audición. Los sistemas de sonido de alta potencia para automóviles pueden producir niveles de presión de sonido superiores a los 130 dB. Aplique el sentido común y practique el sonido seguro.

PRAKTIZIEREN SIE SICHEREN SOUND

Fortgesetzte Geräuschdruckpegel von über 100 dB können beim Menschen zu permanentem Hörverlust führen. Leistungsstarke Autosoundsysteme können Geräuschdruckpegel erzeugen, die weit über 130 dB liegen. Bitte wenden Sie gesunden Menschenverstand an und praktizieren Sie sicheren Sound.

OSSERVATE LE REGOLE DEL SUONO SENZA PERICOLI

La costante esposizione a livelli di pressione acustica al di sopra dei 100dB possono causare la perdita permanente dell'udito. I sistemi audio ad alta potenza possono produrre livelli di pressione acustica ben superiori ai 130dB. Si consiglia il buon senso e l'osservanza delle regole del suono senza pericoli

This symbol with “CAUTION” is intended to alert the user to the presence of important instructions.  **CAUTION**
Failure to heed the instructions could result in injury or unit damage.

- To prevent injury and damage to the unit, please read and follow the instructions in this manual.
- If you feel unsure about installing this system yourself, have it installed by a qualified Rockford Fosgate technician.
- Before installation, disconnect the battery negative (-) terminal to prevent damage to the unit, fire and/or possible injury.

<i>Model</i>	M1D2-8/B M1D4-8/B	M1D2-10/B M1D4-10/B	M1D2-12/B M1D4-12/B
<i>Nominal Size</i>	8" (203.2mm)	10" (254mm)	12" (304.8mm)
<i>Description</i>	Subwoofer	Subwoofer	Subwoofer
<i>Nominal Impedance (Ohms)</i>	2 or 4 Ω DVC	2 or 4 Ω DVC	2 or 4 Ω DVC
<i>Frequency Response (Hz)*</i>	28-750	28-750	28-750
<i>Voice Coil Diameter - inch (mm)</i>	1.5" (4-Layer) (38.6mm)	1.95" (4-Layer) (49.5mm)	1.95" (4-Layer) (49.5mm)
<i>Power Handling - Watts (RMS/Peak)</i>	150/600	300/1200	300/1200
<i>Fs - Free Air Resonance (Hz)</i>	44.5	34	26
<i>Qts</i>	0.9	0.44	0.53
<i>Vas - cu. ft. (Liter)</i>	0.55 ³ (15.7L)	1.56 ³ (44.2L)	4.03 ³ (114.2L)
<i>Displacment -cu. fl. (Liter)</i>	0.05 ³ (1.41L)	0.1 ³ (2.8L)	0.12 ³ (3.49L)
<i>Sensitivity (2.83V/1M)</i>	87.5dB	91.5dB	92dB
<i>Xmax - inch (mm)</i>	0.28" (7mm)	0.28" (7mm)	0.28" (7mm)
<i>Grille/Trim Ring</i>	YES	YES	YES
<i>LED Current Draw</i>	0.25 Amps	0.25 Amps	0.25 Amps
<i>Recommended Fused Rating For LED's (not included)</i>	1 Amp	1 Amp	1 Amp
<i>LED Voltage Range</i>	9-16 Volts	9-16 Volts	9-16 Volts

*** All measurements taken with voice coils wired in series**

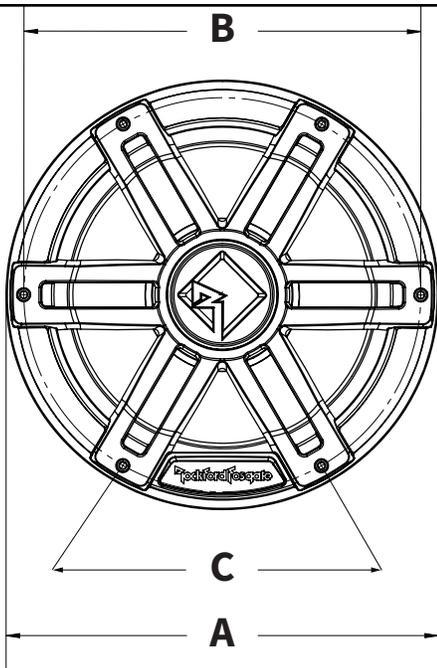
★ Rockford Fosgate determines its rated frequency response range at -6 dB below its nominal sensitivity at upper and lower extents of a speaker's output.



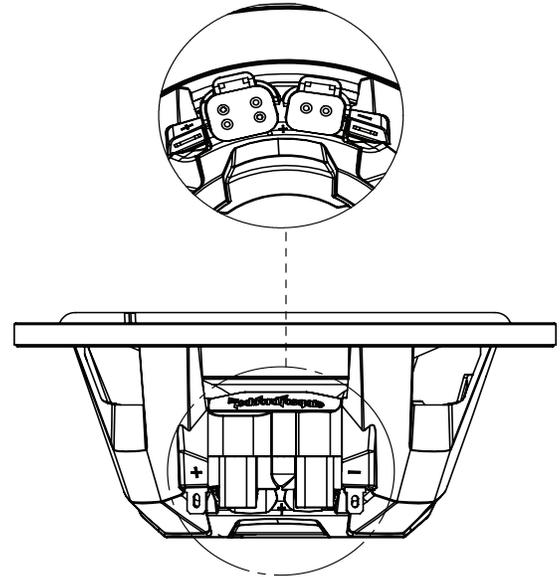
VERIFIED WITH KLIPPEL

To adorn the 'Verified with Klippel' mark, the qualifying company's loudspeaker engineering personnel must be trained and certified by Klippel prior to using the three separate Klippel systems to design, develop and test. Rockford Fosgate has made the investment in Klippel to deliver the best possible speakers and subwoofers to their customers.

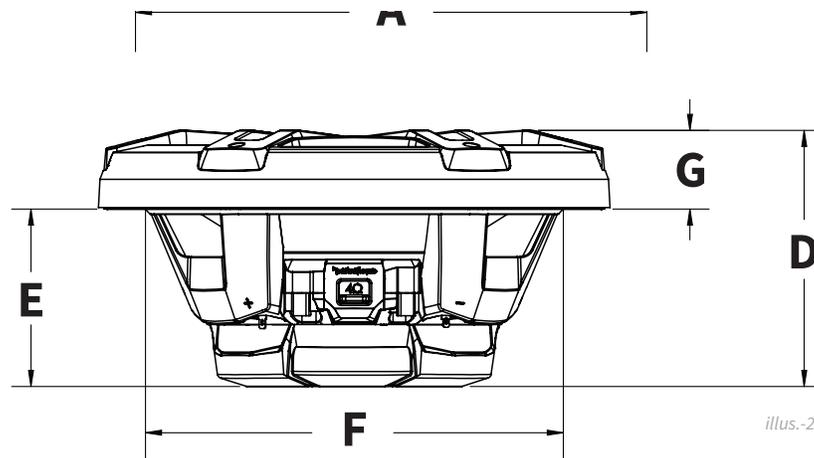
Specifications



illus.-1.1



illus.-3.1



illus.-2.1

Model	M1D2-8/B M1D4-8/B	M1D2/4-10 M1D2/4-10	M1D2/4-12 M1D2/4-12
Overall Diameter (A)	9" (230mm)	11" (281.1mm)	13.28" (337.3mm)
Screw Mounting Diameter (B)	7.76" (197mm)	10.16" (258mm)	12.19" (309.6mm)
Mounting Screw Angle (C)	6@60°	6@60°	6@60°
Overall Height (D)	4.76" (120.8mm)	5.87" (149mm)	6.65" (169.1mm)
Mounting Depth (E)	3.43" (87.1mm)	4.23" (107.4mm)	4.6" (117.1mm)
Cut-out Diameter (F)	7.1" (180.2mm)	8.9" (226mm)	10.85" (275.6mm)
Grill Height (G)	1.33" (33.7mm)	1.64" (41.7mm)	2" (51.9mm)

Carton Contents

- (1) Element Ready™ Subwoofer with fixed Sport Grill
- (1) COLOR OPTIX™ Harness
- (1) Socket head driver bit
- (6) Socket Head Stainless Screws
- (1) 1/8" Drill Bit
- Installation and Operation Manual

Recommended Enclosures

This manual outlines two specific types of enclosures that provide distinctly different performance. This section is to help you decide which type is best for your application.

Sealed Enclosures

Sealed enclosures are the simplest to build. The most important part of building a sealed enclosure is to make sure that the enclosure is airtight. Using glue and some type of sealant on all seams will ensure solid construction and prevent air leaks. The box volume will directly impact the performance of the speaker. Larger enclosures will provide flatter response and deeper bass where smaller boxes will provide a bump in the response curve and generally higher output for greater SPL.

Advantages of sealed enclosures:

- Small enclosures
- Linear (Flat) response
- No port noise
- High power handling at all frequencies
- Excellent for sound quality
- Extended low frequency output when compared to vented enclosures

Vented Enclosures

Vented enclosures vary only from the sealed enclosure in that a vent or port is added to “tune” the enclosure. The enclosures recommended are designed for great overall performance. Larger boxes tend to be easy to tune to lower frequencies while medium and small boxes are easier to tune to higher frequencies. The vented design is less linear in response than the sealed box but with noticeably more output at the tuning frequency.

Advantages of vented enclosures:

- Higher average output than sealed
- Tuning frequency can be easily adjusted by changing port length
- Deep bass response with lower power requirements
- Great for high output with limited power

Infinite Baffle Design

These designs typically called “IB”, are the easiest enclosure types to build. The reason is that you are not actually building an enclosure, but rather simulating one. This is done by closing off a cavity area (ie; car trunk, enclosed area of a boat hull) with a baffle board. This creates your “IB” sub-woofer system. Essentially, an “IB” design can just be considered a large sealed enclosure design. Given that an “IB” design does not rely on a volume of air for its suspension, the low frequency output is driven by the speaker’s inherent damping or “Qtc”.

Advantages of infinite baffle design:

- Easy to build
- Light-weight
- Deep bass response with lower power requirements

Vented vs Sealed vs Infinite Baffle

The graph shown here is a sample of how SPL and Excursion differs

between the various enclosures.

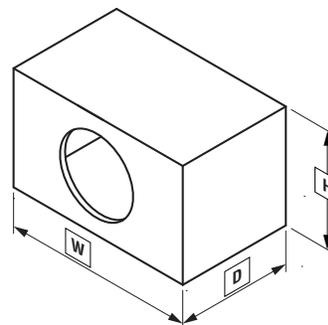
Building an Enclosure

To work properly, the walls of the enclosure must be rigid and not flex when subjected to the high pressures generated by the speaker’s operation. For optimum performance, we recommend using 3/4” MDF (Medium Density Fiberboard) and internal bracing. The enclosure should be glued together and secured with nails or screws.

Calculating Volume

Calculating volume is merely a matter of measuring the dimensions in inches and using the formula: H x W x D divided by 1728 (cubic feet). See block below.

Box Volume	Height” x Width” x Depth”
Divided by (cubic feet)	1728



If two facing sides are of uneven length, add them together and divide by two to take the average. Using this number will give you the volume without the necessity of calculating the box in sections and adding the sections together. The thickness of the baffle material reduces the internal volume so this must be subtracted from the outside dimensions to determine the internal volume. The speaker itself also reduces the internal volume. The amount of air displaced by each model is listed on the specification sheet and should also be subtracted from the gross volume calculation.

Sealed Enclosure

NOTE: Vb is the internal volume, before any speaker and/or port displacement is added. All external dimensions were based on the use of 3/4” (1.90cm) materials.

NOTE: When using enclosures other than recommended, call Technical Support for correct application.

Optimum Sealed Enclosure Recommendation

Sealed Enclosures	8”	10”	12”
Total Internal Volume cu. ft. (Liter)	0.55 (15.62)	1.1 (31.15)	1.65 (46.72)
Woofer Displacement cu. ft. (Liter)	0.05(1.41)	0.1 (2.83)	0.12 (3.4)
V _b - Net Internal Volume cu. ft. (Liter)	0.50 (14.2)	1.0 (28.32)	1.53 (43.32)
F ₃ - 3dB Point (Hz)	47.7	58.4	43.1
Qtc - Enclosure Damping	1.19	0.66	0.88
H - Height - inch (cm)	12 (30.48)	14.0 (35.56)	15.0 (38.1)

Enclosures

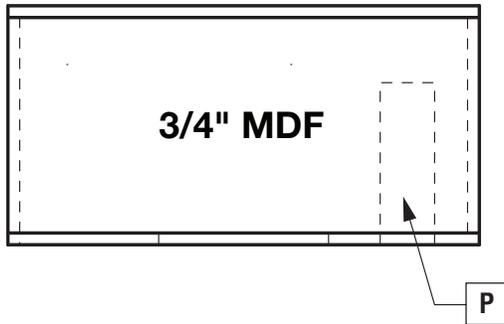
W - Width - inch (cm)	12 (30.48)	16.0 (40.64)	16.0 (40.64)
D - Depth - inch (cm)	10 (25.4)	13.25 (33.66)	15.0 (38.1)

Recommended Sealed Enclosure Volume Range

Sealed Enclosures	8"	10"	12"
V _b - Volume range cu. ft. (Liter)	0.4 to 0.75 (11.34 - 21.24)	0.75 to 1.25 (21.24 - 35.4)	1.25 to 1.75 (35.4 - 49.55)

Vented Enclosures

NOTE: V_b is the internal volume, before any speaker and/or port displacement is added. All external dimensions were based on



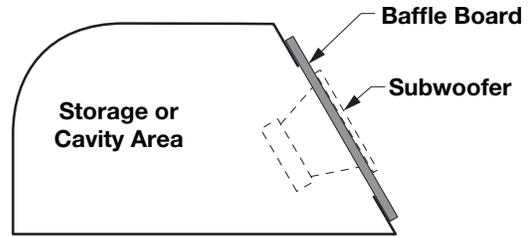
the use of 3/4" (1.90cm) materials.

NOTE: When using enclosures other than recommended, call Technical Support for correct application.

Optimum Vented (Ported) Enclosure Sizes

Vented Enclosures	8"	10"	12"
Total Internal Volume cu. ft. (Liter)	1.10 (31.15)	1.45 (41.06)	2.45 (69.38)
Woofer Displacement cu. ft. (Liter)	0.05 (1.41)	0.1 (2.83)	0.12 (3.4)
Port Displacement cu. ft. (Liter)	.03 (.85)	0.1 (2.83)	0.33 (9.35)
V _b - Net Internal Volume cu. ft. (Liter)	1.0 (28.3)	1.25 (35.4)	2.0 (56.63)
F _B - Tuning Frequency (Hz)	45	40	35
F ₃ - 3dB Point (Hz)	34.7	39	36
H - Height - inch (cm)	12 (30.48)	15.0 (38.1)	16.0 (40.64)
W - Width - inch (cm)	16 (40.64)	15.0 (38.1)	20.0 (50.8)
D - Depth - inch (cm)	14 (35.56)	15.25 (38.74)	17.5 (44.45)
P - Port Diameter and Length - inch (cm)	3 x 9.4 (7.62 x 23.9)	3 x 9.5 (7.62 x 24.13)	4 x 14 (10.16 x 35.56)

NOTE: The port shown can be placed on any face of the enclosure as long as the port ends are not obstructed.



NOTE: When using vented enclosures, for maximum reliability and power handling ensure, that a subsonic or "infrasonic" filter is used so that only usable low frequency signal is sent to the subwoofer.

Infinite Baffle

An Infinite Baffle enclosure design represents an application where the compliance of the air volume within the enclosure is greater than the compliance on the speaker's suspension (V_{as}). An infrasonic filter is required for reliable performance.

Infinite Baffle	8"	10"	12"
F ₃ - 3dB Point (Hz)	42.7	69.4	43.3
V _{as} - cu. ft. (Liter)	0.63 (17.9)	1.77 (50.2)	4.03 (114.2)
Q _{tc} - Enclosure Damping	0.66	0.43	0.54

IMPORTANT: A subsonic or "infrasonic" filter at or above the resonant frequency (F_s) of the speaker is required.

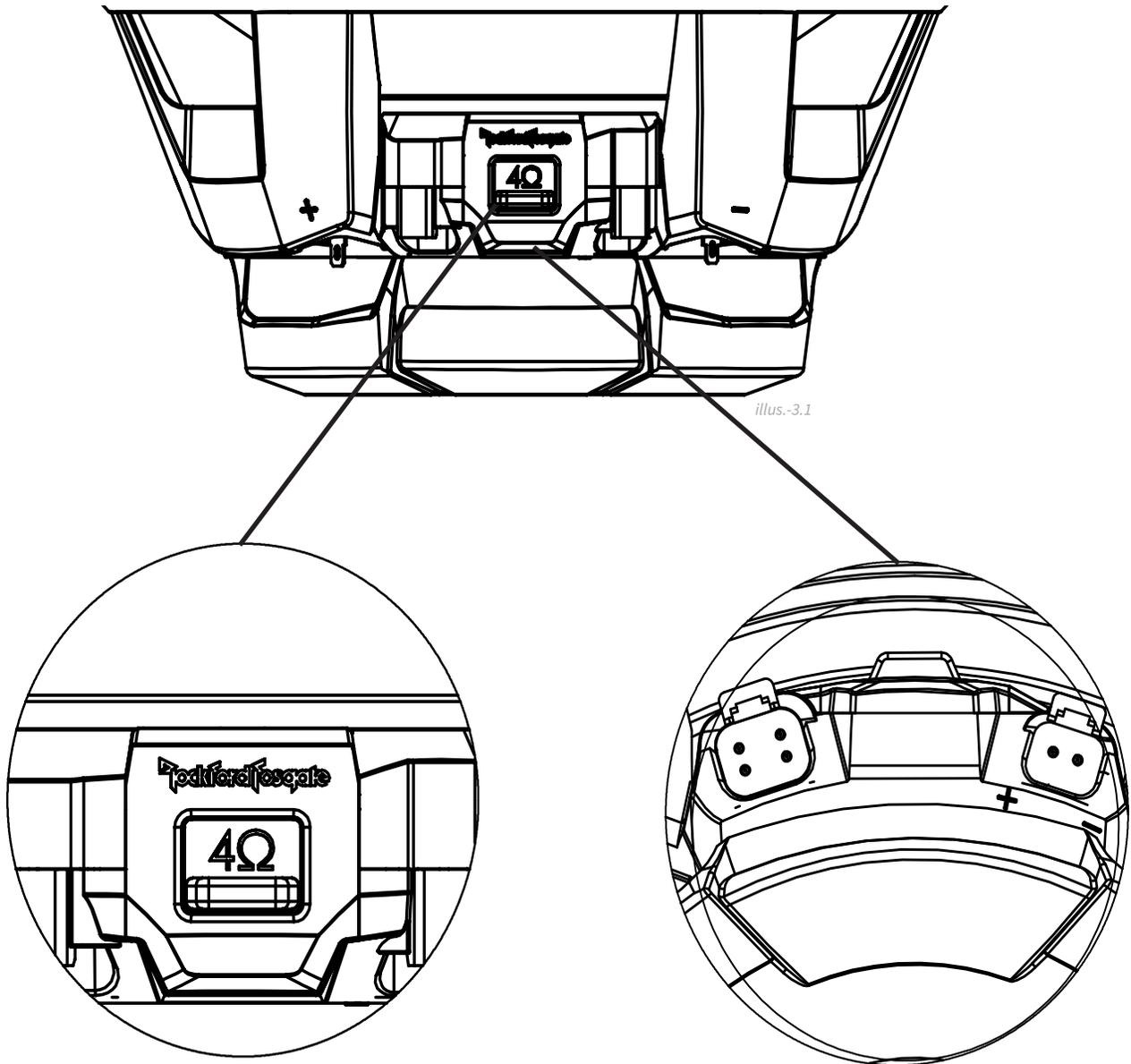
NOTE: Infinite baffle installations will result in lower speaker power handling when compared to fully enclosed applications such as sealed or vented enclosures.

Wiring Configurations

By varying the wiring configuration of your speakers you can create an impedance load to match your system. Altering the wiring configurations gives a range of options for impedance loads. Series, Parallel, or Series-Parallel wiring configurations are different techniques for wiring speakers that provide different loads. Series configuration is a string method where speakers are wired end to end. Parallel configuration uses two or more speakers wired across common terminals. Series-Parallel configuration combines both techniques. Choose the wiring diagram that corresponds to the number of woofers and the impedance of your amplifier.

Subwoofer Crossovers

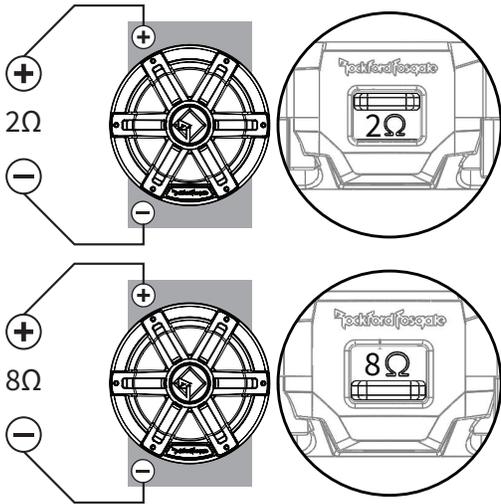
There are two operational types of crossovers, passive and active. Passive crossovers (coils or inductors) are placed on the speaker leads between the amplifier and speaker. An active crossover is an electronic filter that separates the audio signal fed to different amplifiers. For optimum subwoofer performance, we recommend using an active 80-100Hz low-pass crossover at 12dB/octave.



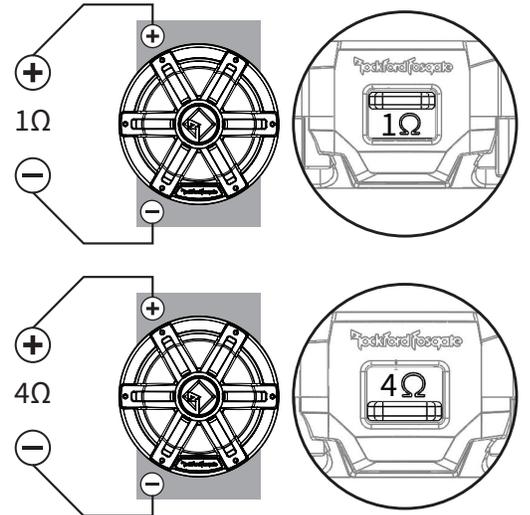
SPEAKER TERMINAL SWITCH

SPEAKER & COLOR OPTIX™ TERMINALS

D4 Impedance Options

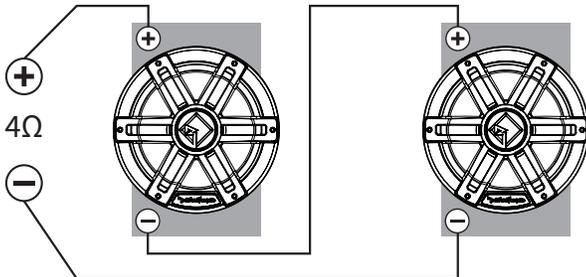


D2 Impedance Options

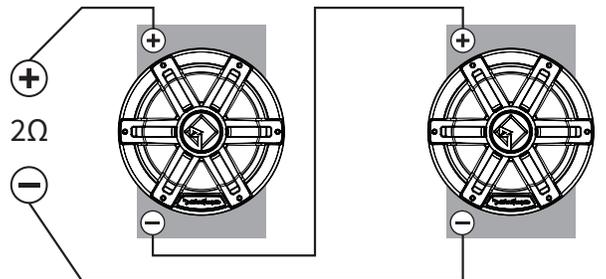


Woofer Series Wiring Options

D4 with Switch on 2Ω

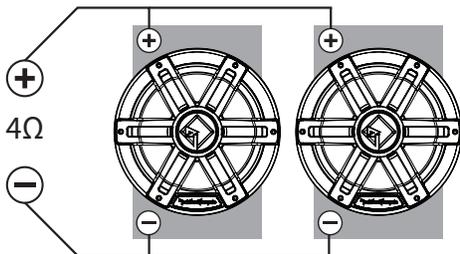


D2 with Switch on 1Ω

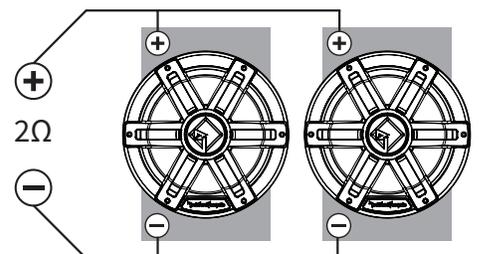


Woofer Parallel Wiring Options

D4 with Switch on 8Ω

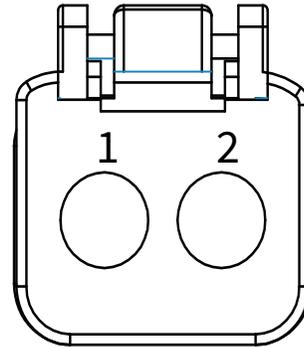


D2 with Switch on 4Ω



SPEAKER Wiring

There are (2) different options for wiring your speakers. Use the included spade connectors (included) as seen in illustration 3.1. You can also utilize the DEUTSCH™/Amphenol style connector (not included) input next to the COLOR OPTIX™ connector.



illus.-4.3

Speaker Pin Out (wire side)
1 - RED - Positive Speaker Input
2 - BLACK - Negative Speaker Input
NOT included with speakers

Connector is DEUTSCH™/Amphenol style DT06-2S

COLOR OPTIX™ Wiring

If not using the PMX-RGB, follow the diagrams below for proper pin out and hard wiring instructions.

COLOR OPTIX™ Wiring Precautions

- Do not connect to 24 Volt electrical systems
- We recommend only using the COLOR OPTIX™ wiring chart or connecting to the PMX-RGB. Connecting any other way could cause damage to the speakers or the device you have connected to.
- We recommend installing a fuse (not included) on the Yellow 12 Volt wire whenever you are NOT using the PMX-COLOR OPTIX™. See COLOR OPTIX™ wiring chart for wiring options.
- Rockford recommends a minimum of 20 gauge wire when hard wiring your COLOR OPTIX™ speakers.
- Never wire the COLOR OPTIX™ lights directly to 12 volts. Utilize either the PMX-RGB or a toggle switch (not included) connected to a fused 12 volt power supply. Refer to the specification to determine the size of fuse (not included) needed

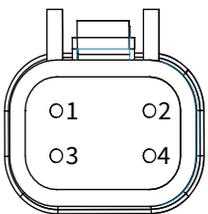
COLOR OPTIX™ WIRING OPTIONS

LED OUTPUT COLOR	CONNECT THIS COLOR WIRE TO GROUND
RED	RED
GREEN	GREEN
BLUE	BLUE
YELLOW	RED & GREEN
PINK	RED & BLUE
AQUA	GREEN & BLUE
WHITE	RED, GREEN & BLUE

Connect colored wires on right to make output color on left.

Connect all Yellow wires together to switched 12 Volts. See Wiring Precautions.

COLOR OPTIX™ Pin Out (wire side)



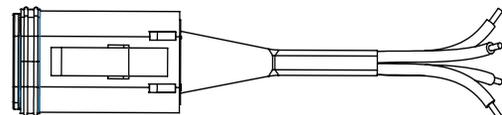
illus.-4.1

1 - RED (Ground Input)
2 - Yellow (12V+ Input)
3 - Blue (Ground Input)
4 - Green (Ground Input)

Included with speakers

Connector is DEUTSCH™/Amphenol style DT06-4S

COLOR OPTIX™ Connector



Included

illus.-4.2

Rockford Corporation offers a limited warranty on Rockford Fosgate products on the following terms:

Length of Warranty

POWER Amplifiers – 2 Years

BMW® Direct Fit Speakers – 2 Years

PUNCH® & PRIME® Amplifiers – 1 Year

Speakers, Signal Processors, Accessories and Capacitors – 1 Year

All marine, motorcycle, motorsport products - 2 Years

Any Factory Refurbished Product – 90 Days (receipt required)

What is Covered

This warranty applies only to Rockford Fosgate products sold to consumers by authorized Rockford Fosgate dealers in the United States of America. Products purchased by consumers from an Authorized Rockford Fosgate Dealer in another country are covered only by that country's Distributor and not by Rockford Corporation.

Who is Covered

This warranty covers only the original purchaser of Rockford product purchased from an authorized Rockford Fosgate dealer in the United States. In order to receive service, the purchaser must provide Rockford with a copy of the receipt stating the customer name, dealer name, product purchased and date of purchase.

Products found to be defective during the warranty period will be repaired or replaced (with a product deemed to be equivalent) at Rockford's discretion.

What is Not Covered

- 1. Damage caused by accident, abuse, improper installation, operations, theft, water (on non-Element Ready products).*
- 2. Any cost or expense related to the removal or reinstallation of product.*
- 3. Service performed by anyone other than Rockford or an authorized Rockford Fosgate service center.*
- 4. Any product which has had the serial number defaced, altered, or removed.*
- 5. Subsequent damage to other components.*
- 6. Any product purchased outside the U.S.*
- 7. Any product not purchased from an authorized Rockford Fosgate dealer. Refer to rockfordfosgate.com dealer locator for more detail.*

Limit on Implied Warranties

Any implied warranties including warranties of fitness for use and merchantability are limited in duration to the period of the express warranty set forth above. Some states do not allow limitations on the length of an implied warranty, so this limitation may not apply. No person is authorized to assume for Rockford Fosgate any other liability in connection with the sale of the product.

How to Obtain Service

Please call 1-800-669-9899 for Rockford Customer Service. You must obtain an RA# (Return Authorization number) to return any product to Rockford Fosgate. You are responsible for shipment of product to Rockford.

EU Warranty

This product meets the current EU warranty requirements, see your Authorized dealer for details.